Space Weather Forecast

Issued on Tuesday, 13 September 2022 at 01:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor Storms days 2 and 4. Moderate class flares considered likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate, with a single moderate class flare observed at 12/2345 UTC. There are four notable sunspots on the disk, of which AR3098 in the northwest quadrant remains the largest and most complex spot. There is also a large spot which has recently rotated onto the southeast limb which may turn out to be a more complex region. A filament eruption and subsequent CME from the vicinity of AR3098 appears to have resulted in a proton enhancement in the near Earth environment. This will be fully analysed when sufficient imagery becomes available.

Solar Wind / Geomagnetic Activity: The solar wind speed has followed a declining trend, with winds at background levels. The total magnetic field strength was generally weak, with the north-south component switching from mainly negative to mainly positive. Geomagnetic activity was initially Unsettled, but became Quiet from 12/0900 UTC.

Energetic Particles / Solar Radiation: The high energy proton flux gradually rose to above the normal background levels but remained below S1 Storm levels

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to increase from Low levels through the forecast period. Moderate levels are considered likely with a very slight chance of reaching Strong levels due to the potential flares from three or four sunspot regions.

Solar Wind / Geomagnetic Activity: A coronal mass ejection which was observed leaving the Sun on 11 September may arrive at Earth on 13 or 14 September, although confidence is low. A negative coronal hole may become geoeffective on day 4 (16th), perhaps bringing elevated solar wind speeds. Geomagnetic activity is forecast to be mainly Quiet to Unsettled through the period, with Active intervals likely and a chance of G1/Minor Storms day 2 (14th) and day 4 (16th), although the forecast is low confidence.

Energetic Particles / Solar Radiation: No solar radiation storms are expected, although the growth of current sunspot regions and recent increases following a CME has led to a slight rise in risk of S1.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	30	10	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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